

## ABSTRACT

The present invention is directed to a fiber optic or other waveguide array for transmitting electromagnetic energy that includes a substrate containing a plurality of substrate rows or layers, and at least one waveguide in each of the substrate layers, each of said waveguides having a waveguide central axis and a waveguide face for exiting the electromagnetic energy. The waveguide face is angled to the waveguide central axis and each of the waveguides are aligned parallel to each other in the substrate layers and at an offset angle to the substrate such that the electromagnetic energy exiting from each of the waveguide faces is substantially parallel to each other and substantially normal to the substrate.